Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME VIII.] NEW-YORK, FEBRUARY 12, 1853. [NUMBER 22.

THE
Scientific American,
CIRCULATION 17,000.
PUBLISHED WEEKLY
At 128 Fulton street, N. Y., (Sun Buildings),
BY MUNN & COMPANY.

Hotchkiss & Co., Boston.
Dexter & Bro., New York City.
Stokes & Bro., Philadelphia.
J. J. LeCount and Wm. B. Cooke, San Francisco, Cal
G. S. Courtenay, Charleston, S. C.
John Carruthers, Savannah, Ga.
M. Boullemet, Mobile, Ala.
E. W. Wiley, New Orleans, La.
E. G. Fuller, Halifax, N. S.
M. M. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Terms—$2 a-year—$1 in advance and the remainder in 6 months.

USEFUL RECEIPTS.

Cure for Rheumatism.

The following recipe for rheumatic inflammation has been lately presented to the French Academy of Sciences, by a retired army surgeon of Paris, as possessing extraordinary curative properties in the above painful affection. Dr. Poggioli, the discoverer, states that in seventeen cases of rheumatism the complaint yielded immediately on the application of this new remedy.

RECIPE—A salt of morphia (hydrochlorate), distilled water, extract of belladonna (atropine), ointment made of the buds of the poplar tree, leaves of black poppy, belladonna, henbane, and nightshade; animal fat macerated in datura leaves, q. s. The composition to be scented with essence of lemon or cherry laurel water.

In many instances mentioned by the discoverer, one rubbing was sufficient with the application of linseed poultices afterwards to effect a perfect cure; it may, however, be sometimes expedient to apply it for a week at the utmost. The proportional quantities of the prescription must be regulated according to the constitution of the patient as well as the nature and extent of the malady.

The inventor, in his account to the Academy, states it to be the result of several years' labor and experience. With regard to its efficiency we cannot say anything, but give it as translated from the "Lumiere," (Paris).

Cure for Erysipelas.

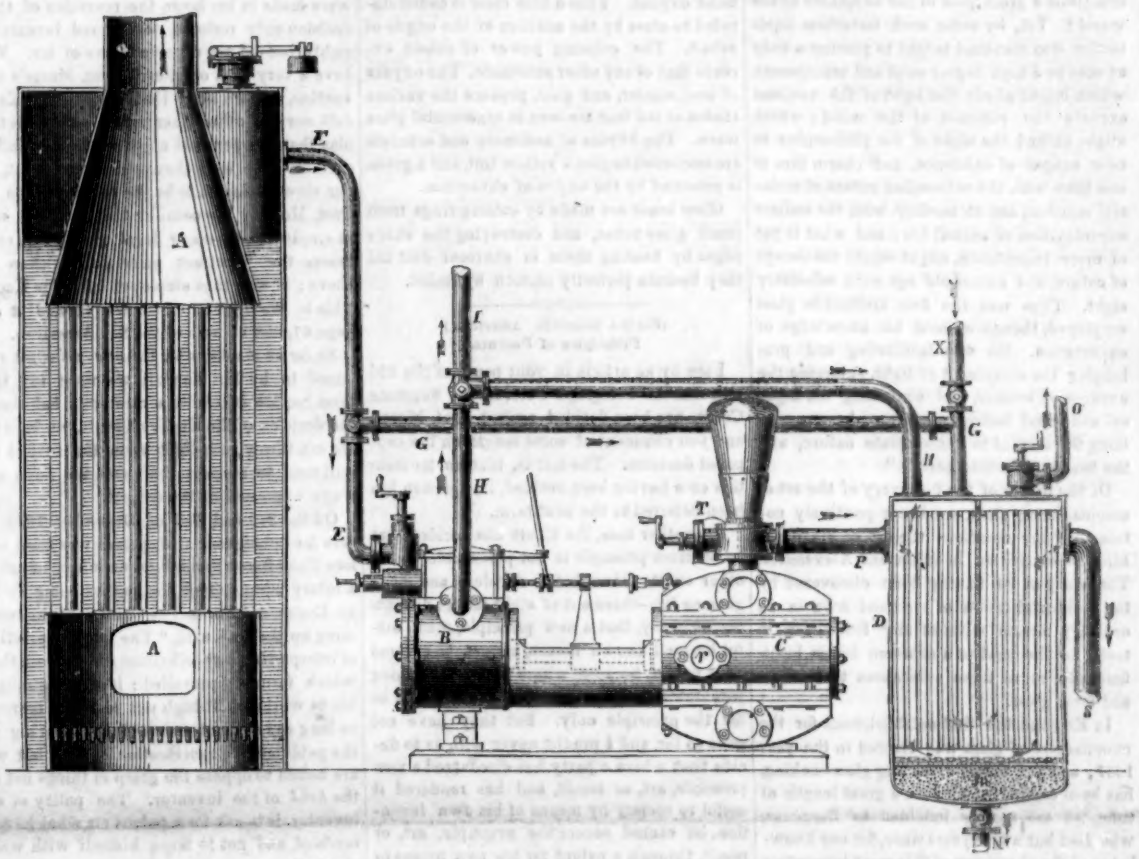
The editor of the "Salem Observer" gives a public cure for this disorder, from which he has been a great sufferer. He says:—"A simple poultice made of cranberries, pounded fine, and applied in a raw state, has proved in my case, and a number also in this vicinity, a certain remedy." In this case the poultice was applied on going to bed, and the next morning, to his surprise, he found the inflammation nearly gone; and in two days he was as well as ever.

Chloroform is being used to remove bees from the honey comb. The hive is placed above a chamber, having a glass window at one side, and a small hole pierced at the other. The chloroform is put in a small bottle having two tubes through its cork, only one of which is allowed to come into immediate contact with the chloroform. The tube which does come into immediate contact with the chloroform is inserted into a small hole in the side of the box, and by blowing into the other the chamber is soon filled with the gas, and they tumble out in a box below.

How to Make Old Oak.

The appearance of old oak may be obtained by exposing any article of new oak to the vapors of Ammonia. Every variety of tint may be procured, according to the duration and temperature of the volatile compounds. A new oak carved arm-chair, exposed to the vapors of the ammonia, will, in about twelve hours, have all the appearance of having been made 200 years before

STEAM PUMP AND FRESH WATER CONDENSER.



The annexed engraving is an elevation partly in section, of a boiler, Worthington & Baker's steam engine pump, and a condenser, combined and arranged in such a compact manner by Charles W. Copeland, engineer, of this city, as must commend the same to the general attention of all concerned.—For ships it is a most commendable apparatus, and should be employed in every one that sails on the ocean; no whaling ship, at least, should be without such apparatuses.

The boiler, A A, is of the ordinary vertical construction. The only noticeable peculiarity in it is, that no part of the tubes is left uncovered by the water, and the smoke-box, or take-up into the chimney, is constructed so as to give a better amount of steam space than usual.

B is the cylinder of the auxiliary engine, and C is a double acting pump; D is the condenser.

The steam-pipe, E, conveys steam from the boiler to the engine, or when the power of the engine is not required, it may be led by means of the branch pipe, G G, directly from the boiler into the condenser.

The exhaust steam of the engine is conveyed by the pipe, H H, to the condenser, D; or when the distilling apparatus is not required, it may be blown into the chimney by means of the pipe, I.

The condenser, D, is cylindrical, and is divided in a portion of its depth by a vertical partition. The steam to be condensed passes through the tubes, and the fresh distilled water produced passes through the filter, *m*, by the pipe, N, to the tank placed in any suitable part of the ship. Any steam which may avoid condensation escapes through the pipe, O. The pump, C, draws water by the pipe, *r*, from the sea, and delivers it through the pipe, P, into the condenser, where it passes outside the tubes (condensing the steam in them by its refrigerating powers), and through a space left at the bottom of the partition, by the course shown by the dotted arrows, and finally escapes overboard by the pipe, S.

When the pump is used as a fire-engine the water is shut off from the condenser, and pumped through one or two hoses attached to the flange, T.

One only other pipe remains to be noticed. We have hitherto spoken of the apparatus as applied to a sailing vessel; but as it may be applied with equal advantage to steamers, a pipe, X, is then provided, by means of which steam from the large boilers may be conducted to the condenser, and the distilling go on without getting up steam in the auxiliary boiler,

A great advantage in having an auxiliary boiler is, that when in port, or if from other circumstances the large engines are not employed, steam may be got up in a very short time, and with very little trouble and expense, and the engine set to work to pump out bilge water, to fill the large boilers, or to act as a fire-engine.

This steam pump is coming into very general use; for feeding a boiler it is the best, and applied as here represented its importance is incalculable, especially for ships going to San Francisco and Australia. We like Miller's condenser better than this one; although it is more expensive it will last longer. These pumps are manufactured in this city.

These steam pumps, we hope, will soon be used in conjunction with every steam boiler, not only in our own land but all others. Indeed, we understand that it has met with the commendation of eminent engineers in England, and is now in successful operation in that country. The pump itself on board of a ship might be attached to a small boiler in the cook's galley, and no more room would be occupied by the whole apparatus here represented, than by the half of a common cooking galley. This simple means of obtaining a supply of fresh water from the salt sea should certainly be embraced as a necessary ship's appendage. In stormy weather many ships are detained at sea for a long time beyond the average length of a voyage. The passages this winter have been very tedious and stormy on the Atlantic; and in ships where there have been a great number of passengers, much suffering has been experienced for want of a proper quantity of fresh water. It conduces greatly to the health and comfort of passengers, to have a plentiful supply of fresh water at sea; it is not easy to carry a tremendous cargo of water casks, hence the water is measured out to them with great care. Here is an apparatus which at once commends itself as an ajunct to the happiness, comfort, and necessities of every passenger on every ship that navigates the ocean.

Coal in Ireland.

The reason why England and Scotland have advanced so rapidly in manufacturing in comparison with Ireland was owing to the very limited supply of coal in the latter country. This, it would appear, will happily be no longer a drawback to (a portion at least) Ireland's advancement. The "Banner of Ulster" says:—

"We announced on Tuesday last, the discovery of coal at the Marquis of Downshire's salt mine, at Duncrue, near Carrickfergus, and we have now to add that a seam of the valuable mineral has been reached fully five feet in thickness. This, we believe, is the largest bed of coal hitherto discovered in the north, and competent judges declare its quality to be very superior. The depth now obtained is rather more than 1,000 feet—800 feet of shaft, and 230 feet of bore. A new shaft is about to be made in the immediate neighborhood of the present one in order that operations may be commenced without delay, to make the rock salt available as an article of commerce."

Basket Willow.

Five millions of dollars' worth of basket willow are annually imported at a cost of from $100 to $250 per ton. It can be produced here, it is said, for $50 a ton. Several species are used for baskets, but the Salix viminalis (basket osier), is considered the best.

MISCELLANEOUS.

[Reported expressly for the Scientific American.]

Lectures on Chemistry.---No. 6.

[An abstract of a Lecture on "Glass," delivered before the Mechanics' Institute, at Cincinnati, Ohio, by Prof. Chas. W. Wright.]

"Who, when he saw the first sand or ashes by a casual intenseness of heat, melted into a metalline form, rugged with excrescences, and clouded with impurities, would have imagined that, in this shapeless lump, lay concealed so many conveniences of life as would, in time, constitute a great part of the happiness of the world? Yet, by some such fortuitous liquifaction was mankind taught to procure a body at once in a high degree solid and transparent, which might admit the light of the sun, and exclude the violence of the wind; which might extend the sight of the philosopher to new ranges of existence, and charm him at one time with the unbounded extent of material creation, and at another with the endless subordination of animal life; and what is yet of more importance, might supply the decays of nature, and succor old age with subsidiary sight. Thus was the first artificer in glass employed, though without his knowledge or expectation. He was facilitating and prolonging the enjoyment of light, enlarging the avenues of science, and conferring the highest and most lasting pleasures; he was enabling the student to contemplate nature, and the beauty to behold herself."

Of the origin of the discovery of the art of manufacturing glass, we know positively nothing. Pliny mentions the art of glass-making as carried on in Sidon and Alexandria. The story of its having been discovered by the accidental fusion of sand and soda in an ordinary fire, is without any foundation in truth, for the heat of a common fire is insufficient to cause these substances to combine and form glass.

In England the first establishment for the manufacture of glass was erected in the year 1557; and yet, notwithstanding glass-making, has been carried on for such a great length of time, we are mainly indebted to Berzelius, who died but a few years since, for our knowledge of the chemistry of this most interesting subject.

Glass is a salt, and is generally composed of silicic acid or sand, combined with soda or potassa, and various other bases. When soda is used a more brilliant lustre is obtained, but it is apt, when used in excess, to communicate a greenish tint to glass. When potassa is used, a perfectly colorless glass is formed, but which is not so brilliant as when soda is the base employed.

The silicates of soda and potassa never show any disposition to assume the crystalline form, but remain amorphous and transparent. Lime is sometimes added to the materials for making glass, and increases its brilliancy and hardness. Oxyde of lead is occasionally used and has the effect of rendering the glass soft, fusible, very brilliant, and perfectly transparent.

Common window glass is composed of the silicates of soda and lime. It is of a greenish color and not very fusible. When long exposed to the atmosphere the soda is partially dissolved out by the moisture, and its transparency impaired. In the vicinity of stables and other places where ammonia is evolved by the putrefaction of organic matter, the silica of the glass is affected, and its transparency diminished.

Bohemian glass, crown glass, and plate-glass used for covering pictures, and for mirrors are composed of silicates of potassa and lime. This is the kind of glass used for staining and other ornamental work. This glass is affected in the same manner by atmospheric and other agents, as common window-glass.

Strass, crystal, and flint-glass are composed of the silicates of potassa and lead. Glass of this composition is very fusible, perfectly transparent, and possesses great refractive power for light. Jewellers use this kind of glass in the imitations of the precious stones. This variety of glass is blackened when long exposed to an atmosphere containing sulphuretted hydrogen gas, from the conversion of the lead into the sulphide of that metal.

Bottle-glass, besides containing the silicate of soda or potassa, is also composed of the silicates of oxyde of iron, magnesia, and alumina. It is used in the construction of carboys, wine-bottles, and all low-priced articles of glass-ware.

Silicic acid, when combined with soda or potassa, or both, forms a glass that is soluble in water, and which has been used to render cloth and wood incombustible, by applying it as a varnish. It is the lime or oxyde of lead that renders glass comparatively insoluble in water.

Glass is colored or stained with various metallic oxydes. Thus a blue color is communicated to glass by the addition of the oxyde of cobalt. The coloring power of cobalt exceeds that of any other substance. The oxydes of iron, copper, and gold, produce the various shades of red that are seen in ornamental glass ware. The oxydes of antimony and uranium are employed to give a yellow tint, and a green is produced by the oxyde of chromium.

Glass beads are made by cutting rings from small glass tubes, and destroying the sharp edges by heating them in charcoal dust till they become perfectly smooth by fusion.

(For the Scientific American.)

Principles of Patents.

I see by an article in your paper of the 22d ult., that the Telegraph Case, in the Supreme Court, has been decided against Prof. Morse, and you comment at some length on the supposed decision. The fact is, that, so far from this case having been decided, its decision has been deferred to the next term.

In another case, the Court has decided that an abstract principle is not patentable, as all other courts have before decided, and have gone so far—three out of eight judges dissenting, as to say, that a new principle, made useful by well known means, cannot be secured by a patent, because, where there is nothing patentable in the means, the patent would be for the principle only. But they have not gone so far, and I predict never will, as to decide that where a party has discovered a new principle, art, or result, and has rendered it useful to society by means of his own invention, he cannot secure the principle, art, or result, through a patent for his new means or machinery.

Indeed, I have no doubt our Supreme Court will go, if they have not gone in the late case, as far as the English courts: those courts, from the lowest to the highest, have decided that where a party has discovered a new principle, and has made it in any degree useful by means of his own invention, he may, by a patent for those means, but declaring that he does not confine himself to the means described, secure the principle, though, in the language of the case itself, "it included every mode of applying the principle or agent so as to produce the specified result, although one mode may not be described more than another—although one mode may be infinitely better than another—although much greater benefit would result from the application of the principle by one method than by another—although one method may be much less expensive than another; and this generality of claim, that is, for all modes of applying the principle to the purpose specified, according to or within a general statement of the object to be obtained, and of the use to be made of the agent to be so applied, is no objection whatever to the patent."

And why not? Is not he who discovers a principle, and renders it valuable to society, or produces an entirely new result from a known principle, the most useful and meritorious of all inventors? And should the law permit another, who would never have thought of the subject but for my discovery (which may be used in a thousand modes), to come in and take it from me by a new mode?

But my purpose was not to go into an argument. In justice to Prof. Morse and the cause of truth, I solicit an insertion of this communication in your paper. AMOS KENDALL.

Washington, D. C., Feb. 2, 1853.

[We are happy to receive any communication in correction of an error. It was telegraphed to our papers here that the U. S. Supreme Court had decided that "an art was not patentable;" and we were informed, on inquiry, next day, that this related to the Columbian Instrument. This was an error, as no such decision was made, but, as stated by Mr. Kendall, the Supreme Court has decided that an "abstract principle" is not patentable—such an one as "an art is not patentable—a result independent of the means of producing it." This was the light in which we viewed the subject. Our language was—"The decision of the lower court was to the effect that "a patent covered an art." This decision has been reversed by the Supreme Court—*its* decision is, 'an art is not patentable.'" Such a decision could not, in our view, be considered "against Morse," for if a wrong decision were made in his favor, the reversion of that decision only restored the injured inventor's rights, but did not deprive Morse of his. We have a very high opinion of Prof. Morse's invention, and we hope that neither Mr. Kendall, nor any other other person, entertains the idea that any personal object or feelings influence us. We have always defended what, in our view, appeared to be the real invention of Prof. Morse. We consider that the word *art*, as employed by many legal gentlemen, embraces the "abstract principle" spoken of above; it was thus employed by Judge Kane. This is the light in which we viewed it on page 67, last volume of the Sci. American.

So far as it relates to the *new principle* referred to by Mr. Kendall, we must say the term has too indefinite a meaning; but about the decision of the English Courts, we believe we can throw such light upon the subject as will tend to support the views we have always expressed on the subject.

On the 2nd and 3rd of December, 1852, a case for infringement of patent was tried before Chief Baron Pollock, for an infringement of a rotary pump patent, the parties being Tetly vs. Easton and Amos. The Chief Baron, in summing up the case, said, "The modern practice of interpreting a specification differs from that which formerly prevailed; if it be intelligible to workmen, though not logically correct, so long as no doubt exists of the meaning of the patentee, the specification is good, but we are bound to oppose the grasp of things not in the *head* of the inventor. The policy of an inventor, is to ask for a patent for what he *has invented*, and not to fence himself with wide claims."

These views of Baron Pollock are sound and to the point; we say no more.

New Discovery.

Within two years we find that several American inventions and discoveries have been appropriated by our brethren across the Atlantic. Among these is one for the manufacture of gas from wood, stubble, straw, etc., which is supposed to be a cheaper method than the same made from coal, oils, rosin, &c. Although I am willing to award credit to the genius of English inventors, and am ready to praise a Watts and an Arkwright, yet I am unwilling to see my own countrymen robbed of their just merits and inventions. Within the last year or so a patent has been issued by the United States for an improvement in making tar, charcoal, gas, etc., from wood. This invention not only embraces the above enumerated productions, but by an ingenious and simple arrangement, collects all the products of the wood, such as acetic acid, pyroxylic spirits, creosote, etc. The whole thing appeared in a practical form previous to any claim by the English, and the enterprising among the oldest residents of Wilmington have now in process of erection an establishment to manufacture wood gas, or pyroligneous gas, to illuminate their streets and houses. In this respect North Carolina has been wide awake, and proves herself something more than the "Rip Van Winkle of the South." Her unfailing forests may yet drive from the market the coal of England for gas, for it may not be known that even in this city English coal lights it up. The pine forests of North Carolina, which have been exhausted of their turpentine, the pine straw all over the grounds, and pine saw-dust are the articles which can be made available for lighting our cities cheaply, and the other articles produced by the destructive distillation of wood, such as charcoal, tar, acids, wood naphtha, etc., will more than pay all expenses and bring the illuminating gas down to a mere song.—[National Intelligencer.

[The National Intelligencer has certainly been made the subject of a light joke. It has long been known to every chemist that bodies containing carbon and hydrogen possess the constituent elements of gas illumination. The economy of any substance for making gas consists in the amount of carbon and hydrogen in the proper quantities for making good light contained in it according to its bulk and weight. Wood, straw, and stubble, are just about as suitable for making gas as cork is for shipbuilding.

Broad and Narrow Gauges.

The subject of broad and narrow gauges, we see, is being discussed in some of our western exchanges. The broad guage seems to meet with the most favor in the west, and hopes are entertained that no narrow gauge will ever be introduced west of the Missouri. The editors who make such remarks have just and proper ideas on the subject.—The broad gauge is to be preferred in a country so favorable for railroads. Mr. Kirkwood, Engineer of the Pacific Railroad, in Mississippi, recommended with his usual sagacity, the broad gauge, and none else, for the Pacific line. It is one of the most exhilirating sights in the world to behold a huge locomotive dashing along on the broad guage, with a huge train behind it. The people west of the Mississippi, we hope, will adopt uniform lines at least, and not have a mixture of broad and narrow gauges, as we have in this State.

Agriculture in Oregon.

The Oregon papers are calling public attention to the peculiar grain growing qualities of the soil of that Territory. The "Columbian" says, there is no country in the world in which wheat arrives at a greater degree of perfection than in Oregon, and certainly none in which a greater yield per acre is obtained, or a more lucrative or desirable market for rewarding the producer, with as little labor.

Caloric on the Mississippi.

A responsible business house in Cincinnati has contracted for the building of a first class packet boat, to run from that city to St. Louis or New Orleans, which is to be propelled by a caloric engine.—[Exchange.

[The above, we are confident, is untrue in every respect. Give us the name of the responsible house. No hot air engine can be built to stem the Mississippi, or to run in the shallow rivers of Ohio. We have seen many queer paragraphs floating about lately, respecting caloric engines, most of them the work of designing or ignorant men.

Broadway Hospital.

One of the successful plans for the proposed new building, and for which a premium was awarded, is by B. E. & I. Buckman, of 94 Fulton street, N. Y., Architects and Builders; this, we think, speaks well for their merit as practical mechanics.

Manufacture of Bonnets.

A new establishment for the manufacture of bonnets has been organized on an extensive scale in Foxborough, Mass. It is calculated to turn out ten thousand straw bonnets a year. It employs 2,000 females and 150 men; but not more than one-fourth of them work in the factory, they being paid by the piece.

Foreign Mining Matters.

The government of Bolivia have prohibited the exportation of tin ores. There have been discovered, recently, in the neighborhood of La Paz, extensive deposits of coal, which appears to be of good quality.

Another valuable silver mine has recently been opened at Copiapo, Chili.

The copper mines in the neighborhood of Santiago de Cuba, are described as very promising.

A block of stone, taken from Braddock's Field, is about to be sent to the Washington National Monument, by James W. Buchanan, Esq., of Pittsburg.

It is stated by the last news from Europe, that guano has been found on the Falkland Islands. This may lead to a reduction in its price, and a consequent benefit to the farmers both at home and abroad.

Machinery and Tools as they are.—Screws and Screw Cutting.

(Continued from page 163.)

The processes hitherto mentioned, exact the continual attention of a skilled artizan, and were they the only means of obtaining screws, would render this invaluable instrument exceedingly expensive. There are, however, more economical methods of producing it, sufficiently well adapted for cutting ordinary threads, and of these the most simple and common is that which cuts the bolts or nuts by dies and taps, employing untrained manual labor for the task, and having the work held firmly in an ordinary vise, whilst the cutting tool is made to revolve and also traverse up and down. When this plan is adopted, it is usual to cut a steel screw in the lathe; this is converted into a tap by the removal of parts of its circumference, in order to give to the exposed edges a cutting action, whilst the circular parts that remain serve for the guidance of the instrument within the helical groove or hollow thread that it is required to form. The taps (for generally two or three are employed) are then hardened and tempered, when they form tools well adapted to cut internal threads as in nuts, for the tap, being of a taper shape, the end enters the nut, and, by turning the tap, using at the same time a slight downward pressure, it forces its way down, cutting a thread as it progresses. This operation furnishes a ready mode of obtaining a counterpart tool adapted to cut corresponding external threads on bolts, for if a steel plate is tapped with slots cut through the threads, and then hardened and tempered, the means of cutting a bolt is afforded. For small works the internal threads are made of fixed sizes, and in thin plates of steel, which are called "screw plates;" for larger works the internal threads are cut upon the edges of two or three detached pieces of steel called dies; these latter are fitted into grooves within "die-stocks," and have various other contrivances that admit of the approach of the screwed dies, so that they may be applied to the decreasing diameter of the screw from the commencement to its completion. The die-stock, in its most general form, has a central rectangular aperture, within which the dies are fitted, so as to admit of compression by one central screw. In general only two dies are used, and a notch is made at the central part of each die, so that the pair of dies present four arcs. The formation of these parts has given rise to much investigation and experiment, as the two principal points aimed at require directly opposite circumstances. For instance, the narrower the edges of the dies or the less of the circle they contain, the more easily they penetrate, the more quickly they cut, and the less they compress the screw by surface friction or squeezing. But on the other hand, the broader the edges of the dies or the greater part of the circle they contain, the more exactly do they retain the true helical form, and preserve the general truth of the screw. A contrivance to practically overcome the defects of both methods is now frequently employed; three dies are used, one embraces about one-third of the circle, the other two much less, and the latter are simultaneously advanced by a double wedge and nut. The large die serves to commence the screw and the two others act alternately, one during the descent, and the other when the stock ascends. By another arrangement one of the stock handles is made to move slightly in a groove formed in the stock, a narrow die is fixed in this handle so that it can bear hard against the bolt, and act like a turning tool; the other die, which is much larger, serving as a guide. In the more simple and primitive method, four planes were filed upon the screw intended for a tap, but this exposes very obtuse edges, which can hardly be said to cut, but which merely indent and burr. A better plan would be to file only three planes, but even then the cutting angle is too great; it is, however, more common to make the tap with three elliptical flutes, which form sufficiently near approximates to the desideratum of radial cutting edges. For screwing large numbers of bolts, the "bolt screwing machine" is generally employed, which is a combination of the ordinary taps and dies, with a mandrel driven by steam power. In one apparatus the mandrel revolves, traverses, and carries the bolt, whilst the dies are fixed opposite to the mandrel, or else the mandrel carries the tap, and the nut to be screwed is grasped opposite to it. In another machine the mandrel does not traverse, it carries the bolt, and the dies are mounted on a slide, or else the mandrel carries the nut, and the tap is fixed on the slide. The tap or die gives the traverse in every case. The "screwing table" is a useful modification of this machine, but is intended to be worked by hand. A long spindle runs loosely in two bearings, one end terminating in a small wheel with a winch handle, the other in a pair of jaws closed by a screw, these retain the bolt whilst the dies are fixed in a vertical frame. An instrument somewhat similar is used by gas fitters, the spindle is however, hollow, to allow long pipes to pass. The formation of metal screws for woodwork is well known to be an important part of manufacturing industry, and has, therefore, caused the introduction of much ingenious self-acting machinery. In this instance the screws are made out of wire, and the various operations of forming the blank, turning and preparing it, cutting a slot in the head and forming a thread, are all done with extreme rapidity by separate machines. The screwing operation is, however, essentially the same in theory as by the modes just indicated, for in all a slow traversing movement is taking place during the time of the more rapid rotating action, so that, in the case of screws for wood, the blank, which is firmly held by a spring clamp, might have the longitudinal motion in addition to revolving, or the cutting tool or die might traverse. In either case, the effects would be the same, and the arrangement is simply a question of expediency and economy. In addition to those already enumerated, various other methods have been used for making screws, and much ingenuity has been employed in effecting this purpose. The threads of wrought-iron screws have been forged whilst red-hot, between top and bottom swage tools having helical surfaces like those of screw dies; screws have been twisted whilst red-hot, out of rectangular bars, by means of the tail vice and hook wrench, as in making screw augers. Screws intended for ordinary vises have been compressed whilst cold, somewhat as with die-stocks; the lever is, in this case, very long, and the die a square block of hardened steel, with an internal square thread screw left smooth or without notches. The thread is partly indented and partly squeezed up, the diameter of the iron cylinder being less than that of the finished screw, this action severely tests the iron.

Other plans for making screws of malleable cast-iron, have been invented, and much ingenuity exercised in the moulding processes. The peculiarities in these latter are, that the core for the hollow worm or box is made in a brass core-box divided longitudinally into three parts; which are filled separately, and closed together with a stick of wood in the centre, to stiffen the core and serve for the core print. The core box is then connected by rings, like the hoops of a cask; this completes the core, which is removed, dried, and inserted in a mould made from a model of the exterior of the box constructed as usual.

In moulding the solid screw, the moulding flask is a tube with a cap having an internal thread, exactly liko that of the screw; the tube is filled with sand, and a plain wooden rod, nearly equal in diameter to the axis of the screw, is thrust in the sand to form a cavity. The screwed cap is then attached to the flask, and a brass screw, exactly like that to be cast, is guided into the sand by means of the screw-cap, and taps a thread in the sand mould very accurately. The screw-cap is then removed, and the second part of the flask, in which the head of the vice-screw has been moulded, is fitted on, and the screw is poured. After having been cast, the screws and boxes are rendered malleable in the usual way except that they are placed vertically, in general the box is slightly corrected with a screw-tap.

There are many other methods of forming the screw according to the purpose for which it is intended, as instanced in the screw joints of water pipes, and in the variety of appliances for which this tool is employed.

(To be Continued.)

Wrought-Iron Direct from the Ore.

MESSRS. EDITORS—The article published in your valuable paper of the 3d inst., being so worded as to convey to those not acquainted with the subject, the idea that Mr. Jas. Renton, of Newark, has just discovered a new principle or process, to manufacture wrought-iron direct from the ore, without previously smelting the ore in a blast furnace, to convert it first into pig, I have given below a recrpitulation of the principal facts, historically recorded, having a bearing on this matter, and showing what has been done so far to bring this desirable process to perfection:—

In 1729, experiments were made in England, and have been noticed by the celebrated Swendenborg, in his treatise on the manufacture of iron. Previous to 1790, trials were made by Wilkinson, at the great iron works of Creuzot, in Burgundy, belonging to Louis XVI. In 1794, Mushet took the matter in hand, and made many experiments throwing much light on the theory of the process. About the same time the brothers Frerejean, of Lyons, made trials on a large scale at their iron works, in St. Etienne, France. In 1812, Hassenphratz published his "Siderotechnie," in four quarto volumes, in the third of which, on page 104, he gives an interesting account of the state of the matter, at that time, and strongly recommends intelligent iron-masters to persevere, in their efforts of finding a practical process to attain a result, the success of which he considered fully warranted by a sound theory. (There is a copy of the "Siderotechnie" at the New York Library). More recently Kaarsten has also given his opinion of the subject, in his work on iron. In 1833 Mr. Geissenhaimer took out a patent in the United States for the same purpose. In December, 1837, Mr. Clay took out his patent in England; of this Mr. Green, of the Boonton Iron Works, New Jersey, took an assignment, and with some modifications of his own, made many trials and a good deal of iron; Mr. Brevoort, the then manager of those works, was also much engaged in these trials. October 11th, 1838, Mr. Chas. Sanderson, of Sheffield, England, took out patents in England and the United States, and made both wrought-iron and steel, and fine cutlery, by this process. In December, 1842, C. S. Quilliard, of Rondout, took out two patents in the United States for the same object. In 1844, Mr. Broadmeadow took out two patents from the United States. Since that time many others have taken out patents, in particular four gentlemen from Newark, viz., Messrs. Dickerson, Salter, Ogden, and James Renton, each separately. No claim for principle or theory of the direct method, can now be established, that has been well understood for years; it is only for some very particular apparatus, furnace, or mode of proceeding, on which claims can now be made.

If Mr. Renton has really discovered, lately, something new, so much the better, I entertain no jealousy; I want the process to succeed, no matter by whom brought to perfection. But this much I may say, that Mr. Renton's first patent was for a furnace in which there was nothing to claim, but an exceedingly complicated contrivance, which disclosed very little practical experience in the iron business. C. S QUILLIARD.

Rondout, Jan 23, 1853.

[It appears from the above communication that what we stated concerning Mr. Renton's improvement has been misunderstood by our correspondent. It was never supposed by us, nor claimed by Mr. Renton, that a new discovery has been made, all that he claims, in his patent, is simply the practical application of the theory, and certain improvements in carrying it out.

Ship Canal.

A project for a ship canal, connecting the waters of the Chesapeake and Delaware Bays, is now before the Maryland Legislature. The bill before the Maryland Legislature provides for the construction of the canal from some convenient point on the Chesapeaks Bay to the Delaware line; said canal to be at least 100 feet wide upon its surface, and 60 feet wide at the bottom, wherever practicable.—The capital stock of the company is to be $3,000,000.

Volcanoes, their Causes.

The general theory embraced by some leading men of science in reference to the cause of volcanoes, is that they are the smoke pipes of the great fire in the interior of this earth. They believe that we are living on the top of a huge white-hot cauldron, and that the volcanoes in different parts of the world are merely vents of this internal fire.

The following are the views of Prof. Silliman, of Yale College, on the subject embraced in a lecture recently delivered in this city:

The internal heat of the earth is proved by direct experiments. A gentleman is still living in Paris, who first called the attention of geologists and philosophers to this subject. He was one of those scientific men who accompanied Napoleon to Egypt, when he went on that great expedition—for Napoleon took with him not only the weapons of war, but he took a much more important cohort—that is, men of science, and art, and literature, able to explore and examine all the antiquities of the most important and venerable country. A great literary work resulted from this expedition, which proved to the world that the interior of the earth was in a heated state, bringing together facts already known, in regard to mines and springs. This general principle announced, has been followed up repeatedly by very deep borings, called artesian wells. The very deep well in Paris had been worked upon for seven years, without reaching water, when Arago came forward and gave the government assurance that if they would continue their work, and go through the beds of chalk, they would, in all probability, find water. They continued their work till they got down through the chalk, when the water rose up in a great volume of twelve feet. This water still flows there, and doubtless will continue to flow to the end of time.—This water was found to be very hot. Many other artesian wells have been made all over Europe, for various purposes, and the uniform result has been that we find the earth increasing in heat the lower we go down. Add to this the testimony of those who work in very deep mines, and we ascertain the fact that the rate of heat increases about one degree for every fifty feet of descent; so that, if we were to go down two miles, we should find boiling water; and at ten miles we might reasonably expect to arrive at ignited rocks. Is all then beneath us on fire? I am not prepared to say, with some, that this is the case, although there is strong evidence to justify such a theory. Witness the geysers of Iceland—where hot waters are gushing up from the earth age after age, and century after century. The result of all observations on springs, goes to show that they are thermal—that is, of a higher temperature. The Azores present a very important fact in example. The hot springs of Lucca, in the Apennine Mountains, are large spouting springs, of a high temperature, so copious, that they may be relied upon for hot baths all the year round. Another case is the hot springs of Bath in England. These are the more remarkable as there are no volcanoes in the British Islands. We know that from the time of the Romans these waters have never ceased to gush up in vast abundance.

The hot springs of the Rocky Mountains are also very important, and the great salt lake in Virginia is very hot. Taking the artesian wells and the thermal, we have, from these sources, the best evidence of the heated temperature of the internal portion of the earth, and this is placed beyond all question by the great volcanoes in the world. And here we have decisive evidence that the heat which will melt the solid rock is not connected with any external cause; for, among the cold, icy mountains, there are volcanoes bursting up to the height of 12,000 feet.

In Spain and South America we find great volcanoes bursting out. The fact is, the world is on fire. It has always been on fire. It was kindled at the time of its creation, and has been burning ever since.

[Dr. Antisel, of this city, recently delivered a lecture, in which the same views are developed; the substance of it we will present next week; as he embraces the electrical theory, he certainly militates against the nebular theory. Both agree as to the internal heat, viz., that we live on the top of a furnace.

NEW INVENTIONS.

New Air-Tight Oven.

An improved baking apparatus, denominated "Barstow's Air-tight Furnace Bake Oven," has been invented by Benjamin Barstow, of New York City, who has taken measures to secure a patent. It consists in arranging within an air-tight outer casing, one or more ovens over the furnace chamber, in such a manner that when the fire is in full blast the rising flame or hot air will be allowed to have a free course and circulate underneath the bottom, over the top, and along the sides and ends of the ovens. This is effected by means of passages in the top plate of the furnace through which the hot air and flame passes, and circulates freely, as described, to the ovens, the bottom plates of which are similarly provided with passages for the admission of the hot air and flame. Dampers are likewise affixed to the passages of both the ovens and the furnace, so that the quantity of heat can be regulated at will, and they can be so operated as to let on the flame to the ovens in a zig zag manner instead of in a direct line. This arrangement is useful in case the heat is too great on one side and not sufficient on the other. The ovens, which are placed in a row one above the other, may be indefinite as to number, and are separated from each other, and the outer wall by partitions and metal rods, these latter, which extend completely across the under sides of the ovens serve to support them, and have their bearing in the wall. Any number of ovens, one or more, can be heated, according as may be required, and there is an independent arrangement consisting of pipes, by employing which the ovens can be used for baking meat as well as bread, the apparatus being more particularly intended for the latter purpose.

Improved Portable Umbrella.

Measures have been taken by Henry Richardson, Sheldon Morris, Jr., and Bennet C. Perry of Litchfield, Conn., to secure a patent for a new description of umbrella. This is a compact arrangement to enable an umbrella to be folded into so small a compass that it can be placed in the pocket or otherwise conveniently packed for travelling. The stick is formed of several pieces, which screw together, and by means of shoulders are maintained in a steady position. A small link and swivel prevent the several pieces from becoming detached, when the joints are unfastened and yet do not check the action of the screws. Each rib is jointed and is kept in a proper position by a spring and catch, which easily yield when the umbrella is required to be folded.

Paine's Patent Ventilating Cars.

MESSRS. EDITORS—With reference to your article on the subject of Mr. Goodyear's "advertisement," permit me to say, that there has not been any question of interference between Mr. G. and myself, on the subject of my patent for ventilating railroad cars, on the contrary, Mr. Goodyear, just previous to his death offered me twenty thousand dollars for my patent. A few weeks since I caused an interference to be declared between Mr. Goodyear's administrator and myself, for the purpose of testing his right to the use of any kind of deflectors to a car window. Unfortunately for my position, the term "screens" was in my claim, and as Mr. Goodyear's patent claims the use of screens, and screening action only, the decision was against me. My papers, however, have been amended, and a different result will be declared in due time. My claim is for windows adjusted so as to act as deflectors, and my patent is the only one issued for a deflecting process, and my patent remains intact. H. W. PAINE.

New York, Feb. 2nd. 1853.

Curious Experiments on Silk Worms.

By experiments that have been lately made, it appears that the natural silk from the silk worms can be obtained colored as desired by administering colored articles of food to silk worms just before they begin spinning their cocoons. The first experiments were conducted with indigo, which was mixed in certain portions with the mulberry leaves, serving the worms for food. The result of treatment was successful; blue cocoons were obtained. Small portions of bignonia chica having been added to the mulberry leaves, the silk-worms consumed the mixture and produced red colored silk.

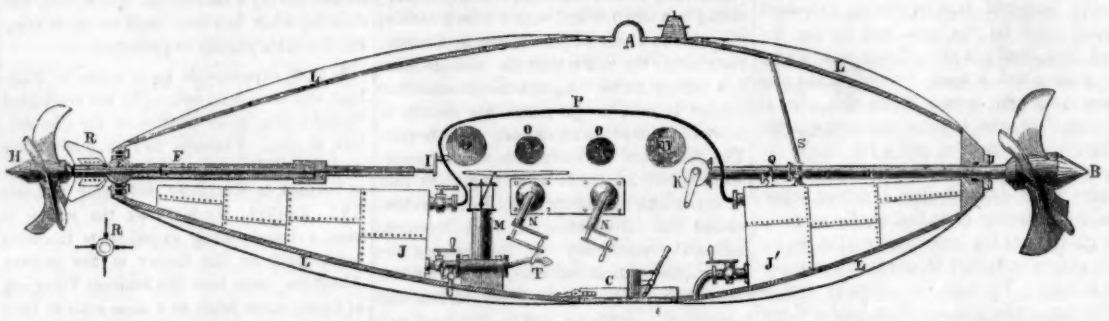
Gum Arabic Starch.

Take two ounces of fine white gum arabic, and pound it to powder. Next put it into a pitcher, and pour on it a pint or more of boiling water (according to the degree of strength you desire,) and then having covered it let it set all night. In the morning, pour it carefully from the dregs into a clean bottle, cork it, and keep it for use. A table spoonful of gum water stirred into a pint of starch that has been made in the usual manner, will give to lawns (either white or printed,) a look of newness when nothing else can restore them after washing. It is also good (much diluted) for thin white muslin and bobbinet.

Correspondence.

We have received a number of articles on the "Caloric or Hot Air Engine." One or two of these, which differ in opinion from us, we will try and present next week.

PHILLIPS' SUBMARINE PROPELLER.

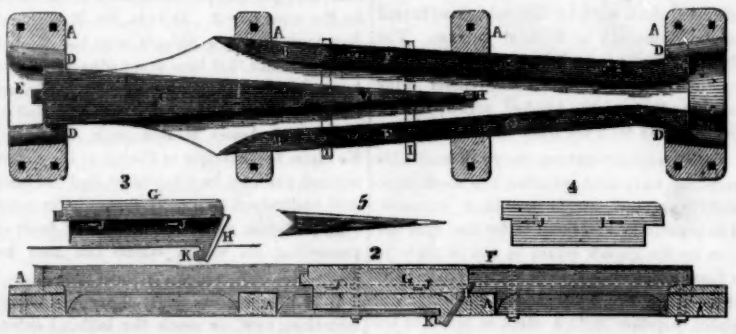


The annexed engraving is a longitudinal section of a Submarine Propeller, invented by L. D. Phillips, of Michigan City, Laporte Co, Ind., and for which a patent was granted on the 9th of last November (1852). The object of it is for exploring the bottoms of rivers, harbors, &c. The axis of the propeller is mounted on a universal joint, so that it can be inclined in any direction, for the purpose of applying the whole power of steering the vessel when necessary. This figure represents an oblong vessel made of boiler plate, or wood, and ballasted so as to descend to the proper depth.

A is a strong glass light on the top, and O O are small side glass lights, and D D are reflector lights; L L L L are keels for keeping the vessel steady. There are two chambers, J J', made in the inside; they are air and water tight. J is the air, and J' the water chamber. M is an air pump, to force in the air into the chamber, J, until it is equal to the pressure of several atmospheres; P is a pipe communicating with the air and water chambers; its object is to force out water, when required, by the pressure of air through the pipe seen below, leading out at the bottom, and the pipe, S, is to allow compressed air to escape, when more water is required to increase the weight of the vessel; C is the bottom hatch for discharging ballast, &c. T is a pipe to admit air into the pump; N N are clamp handles, whereby men in the inside can work the shears outside, for raising any thing. B and H are screws for propelling the one in front and the other behind. The former is operated by the crank, K, and the stern one by crank I. R is the rudder, it has four flukes; F is a hollow shaft of the propeller, H; and G is the spindle of the rudder. E is a ball joint, which is so packed that no water can enter. It is this ball joint which enables the stern propeller to be depressed, so as to make the bow of the vessel rise; or be elevated so as to make it dip, and it can also move it on any line; Q is a pipe to take off air for supplying the cabin, and V is a discharge pipe. As the air is confined under a heavy pressure, a fresh quantity is let out from time to time, to supply the operators. There is a hatch on the top, which is sealed when the vessel is submerged; when the upper hatch is open, the bottom one is shut, and vice versa. Persons can examine the bottom of a river through the lower hatch, as the water can only rise to a very small height. The vessel is now represented as being moved in a horizontal direction. By throwing out stone ballast the apparatus will at once ascend to the surface, and the screw will assist it in steering upwards.

The claim of this patent will be found on page 78, this volume of the Scientific American. It can be employed under water, to discharge shells into a vessel by making such shell with sharp horns like the one shown on the top, then sinking it into a ship's side, and igniting it by a small galvanic battery inside. The inventor of the improvement on this vessel, has made many successful trials with it, as we have been told. More information may be obtained by letter addressed to him at the place designated above.

IMPROVED RAILROAD FROG.---Fig. 1.



The annexed engravings are views of an improvement in Railroad Frogs, invented by Marshal S. Curtis, and Edgar St. John, of Binghamton, N. Y., and for which a patent was granted on the 10th of August (1852).

Figure 1 is a plan view of the railroad frog; figure 2 is a sectional elevation; figure 3 is a side view of the movable wrought iron point, G, showing the slots, J J, for the pins, I I, also showing the key, H, and the notch, K; figure 4 is a different style of frog point, from that of figure 5, which is an underside view of G. The same letters refer to like parts on all the figures.

The improvement consists in the peculiar manner of constructing the shank of the movable point, with projections, or hooks, fitting a corresponding slot or channel, formed with recesses in the bed-plate thereof, whereby said point is secured in its seat by a wedge-shape spike, pressing against the end of the frog point, and passing through the said bed-plate, into the frog block below, which forces said point close against the truncated end of the frog; and it may be further secured from any vertical or lateral movement, by the insertion of bolts, horizontally, through its shank and said bed-plate, thus obviating the practical disadvantages arising from the present method, in general use, of drilling holes, vertically, through that part of said point most subject to the tread and friction of the flanches of the wheels, and lessening the expense of constructing, keeping the whole frog in efficient repair, and, consequently, augmenting its durability.

A A A, and B B form the cast metal bedplate of the frog, and C is the rail of it cast along with the said plate; D D are clutches to embrace the rails which join on the frog; E is the part where the rails meet at one end against the frog rail, C; F F are guard steel plates bolted to the bed plate; G is the movble wrought iron frog point; H is the vertical key at its point, and I I are cross pins. If the pins, I I were withdrawn, still the movable point could not be removed, for the key, H, will still retain it, and it cannot be withdrawn without an instrument. This manner of securing the movable point, G, is evidently a very excellent one, as the key, H, when out, allows of the point, G, being placed to the right, then pushed to the left to make it take into the frog plate as shown in figure 2, also to make the notch, K, catch over the projecting part of said plate. The key, H, then drives all up close and tight, so that there can be no lateral nor end motion of the movable point—a most important consideration. The claim for this improvement will be found in our list, Vol. 7, of the date mentioned above.

The figure 4 of the point having no hooks upon it, is the pattern used by the New York and Erie Railroad.

More information may be obtained by letter addressed to the inventors at Binghamton.

Daguerreotyping.

M. Niepce de St. Victor has presented a third memoir on Heliochrome, or sun coloring, to the French Academy of Sciences, which we will give, in extenso, next week, as it contains much of interest to all Daguerreotypists. It was mentioned by M. Arago, to the Academy, on the occasion, that it is not *by contact*, but in the camera, that M. Niepce operates, and that he obtains *every color*. He likewise noticed a very remarkable fact that M. Niepce has observed in his experiments, and to which he directed the study of philosophers, namely, that the morning light has a much greater photogenic action than the evening light. For example, if a prepared plate is exposed from nine o'clock till noon, in the camera, the colored impression will be obtained in a much shorter time than if the same experiment were made from noon till three o'clock. Moreover, if the pictures are looked at by a strong light, M. Niepce not having yet found the means of fixing them completely, the colors become faint, but this effect is very perceptible if it is morning, whilst it is almost nothing in the afternoon. At the close of his remarks, M. Arago used these significant words—"M. Niepce has resolved the problem—nothing further remains for him to do but to perfect it by the permanent fixing of the colors."

Chinese Industry.

Parrot's building in San Francisco, of one hundred feet front, seventy or eighty feet deep, and four stories high, all of solid granite, was put up in Canton, block by block, by Chinese workmen; and the blocks being all numbered, the building was then taken down, put aboard ship, brought across the Pacific, and re-erected in San Francisco by the same hands.

Scientific American

NEW-YORK, FEBRUARY 12, 1853.

Safety Plates for Steam Boilers.

A patent was granted to Henry Waterman, of the city of Williamsburgh, N. Y., on the 28th of last December, for an improvement in steam boilers, so as to render them safe from dangerous explosions. The claim for this petent will be found on page 134, this volume of the Scientific American. On Wednesday, last week, the 2nd inst., we witnessed an experiment with a large cylinder boiler, to test the merits of this invention. The experiment was made at Messrs. Waterman's Block Factory, near Peck Slip Ferry, Williamsburgh. Mr. Curtis, Inspector of Boilers, in this city, and several other scientific gentlemen, were present. The improvement consists in having a top plate of the boiler perforated with a number of holes opening into a small chamber inside of a dome. The top plate of the small chamber, is called the "safety plate," and is made of thin brass capable of standing a certain defined pressure according to its thickness and area, of at least six or seven times less than the iron boiler plate. This safety plate is grooved and screwed down by a ring on the perforated top plate of the boiler, leaving a small chamber between the two. The steam from the boiler passes through the holes spoken of, and presses against the brass or safety plate, which, when the steam rises to the defined pressure, said plate, is torn, open, (brass and copper do not fly to pieces like iron plate), the steam escapes up the dome, and thus the boiler is relieved of its excess of pressure, and all danger of its flying to pieces obviated. The object in having the boiler plate perforated, is to prevent the water from being thrown out of the boiler with the steam, when the safety-plate is torn by the pressure; also to offer a considerable resistance to the escaping steam, so that a too large volume may not jump at once from rest, and by its great and suddenly applied dynamic force tear away the top plate of the boiler. When the safety plate, therefore, is torn open, the boiler is at once relieved of its excess of pressure, but in such a manner that the water is retained inside, and the confined steam allowed to escape without danger to the boiler, or any person who may be around it. The experimental brass plate on the boiler, which we saw, was in thickness 0·25 wire gauge, and 19 inches in diameter. We were told that it would be torn open at 60 lbs. pressure; and at that exact point, while looking on the steam gauge, the plate was suddenly torn open, but not off, and the indicated pressure suddenly fell from 60 to 40 lbs.; and gradually to 10 lbs. A boiler should never be allowed to carry over one-third of the pressure it is capable of standing, therefore if a boiler is capable of standing 300 lbs. pressure it should only be loaded with 100 lbs., which will be the strength of its safety plate; others are made for boilers, varying from 20 lbs., and upwards, thus insuring a certain and safe relief when the defined pressure point is reached.

When the water in a boiler falls below the water line, and covers the flues in a very thin sheet, steam is generated with great rapidity, and we have often seen a very sudden rise in the gauges, from 60 to 80 lbs., a safety valve in such cases presents an inefficient opening for such a sudden generation of steam; this safety plate appears to answer a better purpose, by being torn open before the flues are uncovered.

There can be no doubt but it is more economical to generate steam under a high pressure, and then expand it for working an engine, than to generate it under a low pressure. A means to insure safety and work high pressure steam, will enable our ocean steamships to save much fuel. This object appears to us to be obtained by Mr. Waterman's improvement, which has been tested a number of times with uniform success.

Burning Fluids—Newell's Wire Gauze Lamp.

On page 160, we presented some extracts from an article taken from the Haverhill "Gazette," Mass., on the subject of Burning Fluids and Newell's Lamp. The article stated that holes were made in the lid of said lamp at the suggestion of Dr. Jackson, of Boston. Mr. Newell has written us a letter asserting that this is not true, and Dr. Jackson himself has also called upon us, and stated that he never made such a suggestion. The statement, then, in the Haverhill "Gazette" is not reliable. Before we made any remarks on the article referred to, we examined the list of patent claims to discover whether—as was therein alleged—Isaac Jennings, of New York City, had invented a Wire Gauze Lamp to prevent explosions, in 1836; we could not discover then, as we stated, and have not since, any claim set up for using wire gauze in a lamp like that of Mr. Newell's. We have discountenanced the use of the common burning fluids in houses where there are servants or children. The most ingenious lamps and feeders may be employed, but careless and timorous persons will sometimes spill the fluid, and we have seen more than one explosion caused by such means, independent of lamp or vessel containing the fluid. There is no fluid, however, so clean and beautiful for artificial illumination, as that of a mixture of alcohol and turpentine distilled together. We have been informed by a friend in Boston, that no turmeric colored fluids were sold there, but a mixture of alcoholic solutions and resins. This gentleman uses a hydro-carbon fluid, mixed with diluted alcohol, which affords an enduring and beautiful light, although containing 20 per cent. of water, which lessens its dangerous qualities, but which, at the same time, detracts from its illuminating powers. If sold, however, at a price, in proportion to its cost; such a fluid is preferable to a more concentrated one. This gentleman, who is a distinguished chemist, has submitted Newell's Lamp to several severe tests, and although strongly prejudiced against the use of burning fluid, he says the said lamp under no condition failed to prevent an explosion.

Clipper Ships—American and English.

In an article in the Scientific American a short time ago, we said, in answer to some hasty remarks made by the "Niagara Mail," "whenever it is shown that a British clipper ship has beaten any American one in a fair race—day by day—we will give the winning ship full credit for the same, and not feel the least chop fallen." We also called upon those who boasted of the superiority of the British clippers, to show their courage and confidence by taking up the Boston challenge.

The "London Expositor" has made some comments upon our remarks, which are very temperate, although it is mistaken in supposing there is any acidity in our dispute with the "Niagara Mail."

The "Expositor" asserts that the American clipper ships were beaten last year by the Aberdeen built clippers. If so, we give them full credit for having done so well, but the accounts received by us are as follows:—"Aberdeen ship Chrysolite, 106 days from Canton to Liverpool; American ship Challenge, 105 days from Canton to Deal: British ship Stornaway, 109 days from Canton to Deal; American ship Surprise, 106 days from Canton to Deal. From Shanghai to Deal, American ship Nightingale, 110 days; British ship Challenge, from same place to Liverpool, 113 days. It appears to us that the races are in favor of the American ships. The Chrysolite appears to be as fast a clipper as any of ours, and the Aberdonians deserve great credit for the fine ships which they build; they are manfully upholding any credit that England has for fast sailing ships. The "Expositor" alludes to the recent voyages of the Marco Polo, a clipper ship built in New Brunswick, N. A., and says, "it ran from Liverpool to Australia in 60 days; we do not know if any ship built in an American port has ever equalled her speed; in her run home she repeatedly made 300 miles in 24 hours." The Marco Polo has done well, we wish not to ruffle a feather of the plume which her builders deserve; at the same time let us observe she is an American built ship, not a Yankee one to be sure, but a provincial one. Our next door neighbors cannot live so near us and not catch the true spirit. The clipper ship "Flying Cloud," built in Boston, by D. Mackay, however, has run 336 miles in 24 hours, thus beating the Marco Polo. We do not wish to be speaking of these things like jockeys about the conflicts on the "turf," we believe that the spirit of emulation in building fast ships, is a noble one; it tends to advance one of the noblest—if not the noblest—of architectural arts, therefore we say the *prudence* of the British merchants spoken of by the "Expositor" in respect to betting, although we commend them for their principles, shows that they do not feel the keen spirit of national rivalry in this contest, or else they have no confidence in their own ships. These must be the causes for not accepting the Boston challenge, for London merchants are not more moral than our Boston friends. We must take this occasion to say that in principle we are opposed to all betting—these conflicts for an honorable superiority should all be *for love*, as a son of the Emerald Isle would say. We will still consider the American clipper ships as the victors on the ocean race course; and must do so until we have particular evidence to the contrary.

City Railroads.

The subject of City Railroads is becoming one of such absorbing and universal interest that we cannot well allow the present occasion to pass by without a few remarks. A fresh impetus has been likewise lately given by the counter movement of the Legislature, rendering nugatory the attempts of the Corporation to foist upon us an unjust and corrupt scheme of their own concocting, by which nobody would have been benefitted but themselves and their patrons. Plans of a similar description we will never uphold, and therefore we are rejoiced to see that a superior and more honest party has stepped in to prevent a gross injustice; the Legislature, by their interference, have proved themselves worthy of their station, and of the confidence reposed in their integrity by the people of New York. It is not, however, upon the Broadway Railroad that we wish merely to comment, nor to confine our remarks simply to a single scheme, but to the subject of City Railroads in general. This, as yet a comparatively new field of enterprize, is daily becoming of paramount importance, and the railroad appears soon destined to be as ordinary a system of conveyance through our streets as along the highways. The demand for this almost indispensable accommodation is becoming general in large cities, and is not confined to ourselves, although New York is more favorably built for their formation than many other places, the width and straightness of the streets allowing of city railroads at a very little comparative expense. In London, the huge capital of England, the same outcry is being raised for railroad accommodation, and although, from the position of the business part, called "the city," which is placed centrally, there is not so urgent a necessity for railroads as with us, yet it is probable that railroads connecting the different parts of that metropolis, will eventually be made. Different schemes have been proposed for this purpose, as the narrowness of the streets, and the numerous buildings crowded in the rear forming courts and alleys, present a formidable obstacle. Any railroad in that city must, therefore, be carried over the houses or else be tunnelled under ground, and it is proposed in the London "Artizan" to effect this object by the first-named method. This however, is not altogether an original plan. for two short lines of railway, the Greenwich and Blackwall are built in this manner, and are carried over the streets and houses—in the case of the Greenwich Railway by brick arches, and of the Blackwall railway partly by cast-iron columns and girders. This latter plan is proposed in the "Artizan," with the additional improvement that a street underneath should be built by the railroad company, which could be lighted both from the sides and the top, for which purpose a large part of the railway surface could be flagged with thick glass. How far such a plan would succeed we are not prepared to say, but we see nothing impracticable in the method, and we suggest something of the kind to our city railroad projectors. If objections are raised to railroads in crowded thoroughfares like Broadway, it would be easy to form a viaduct, either quite level or with a sufficient incline, as might appear desirable. In the case of the two railroads alluded to, the stations forming the termini in London are above the tops of the highest houses, and a similar plan could be adopted here, the passengers, goods, &c., could be lowered by a movable platform to the level of the street if a proper incline could not be obtained from want of space. The viaduct railroad might be more expensive than one made on the ground, but it possesses many advantages for a crowded thoroughfare like Broadway, it would not interfere with the ordinary traffic, and the locomotive could be employed the whole distance, thus saving the cost of horses and drivers, which amounts to a large item in the expenses of the New Haven, Harlem, and Hudson River Railroads.

Ventilation of the Crystal Palace.

In all the specifications that we have seen of the adopted New York Crystal Palace, no arrangements have been made for proper ventilation. This is a most important oversight and should at once be provided for. The London Crystal Palace, in a climate averaging 20 degrees below our summer temperature, was oftentimes far from comfortable. The heat of the atmosphere of the New York Crystal Palace, under our blazing summer sun, will be like that of an oven—it will really be a "hot-house." Such a mass of glass as will enter into its composition, will so concentrate the solar heat as to make the atmosphere of the interior totally unfit for human beings to breathe. This can be remedied if measures are taken in season for proper ventilation. These measures must be undertaken on a grand scale to insure success.

Ventilation of Ferry Boats.

Some of the new ferry boats running between our city and Brooklyn, are well ventilated; the old boats are defective in this essential particular; and the Williamsburgh boats, when the cabins are crowded, are no better than the Black Hole of Calcutta. Pure air is as essential to health as pure water: no person would drink out of the gutter; but who is so dainty respecting the atmosphere, of which he must drink continually? Some of the boat cabins for gentlemen (wrongly named) are converted into smoke houses, totally unfit for decent men or beasts.

The Extension of Patents.

"A careful watch must be kept upon Congress, to see that no extension of patents are carried through by a *coup d'etat*."

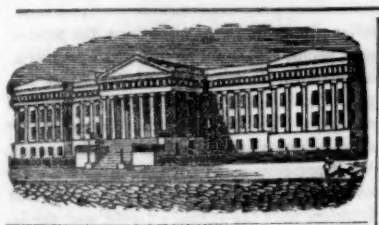
So writes a correspondent to us about the Woodworth Patent. We have no fears of any such result as long as the present Chairman, Mr. Cartter, is at the head of the Committee on Patents in the House of Representatives. No harm, however, comes of being watchful.

Iron Interest of New York.

The "Rondout Examiner" directs our attention to the importance of new improvements in the manufacture of iron, to reduce the cost of both pig and wrought-iron. The "Examiner" has called attention to an experimental college for experiments to accomplish such desirable results. The plan is a good one—but, at the same time, we want to see large iron works established and conducted with spirit and enterprise with the present knowledge we now possess. It is our humble opinion that iron can be made cheaper here at any time, in some districts at least, than it can be made either in England or Scotland. We have coal and iron lying beside one another, and the price of manual labor in making a ton of iron is not so much as some pretend. More men of capital should enter into the business and conduct it upon a large scale.

We have been informed that M. G. Farmer, of Boston, whose name is so intimately associated with the Municipal Telegraph Alarm, has invented an improvement on Grove's Battery, of such a nature as will reduce the cost of working it about 50 per cent. We do not know in what the improvement consists, but give the statement for what it is worth: if it is as represented, the value of it to the community is incalculable.

Sears C. Walker, so distinguished for his researches in practical astronomy, is no more; he died in Cincinnati on the 30th ult. His health was impared for a long time by severe mental exertion in scientific studies and researches. We have lost one of the ablest men of science in our country.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 1, 1853.

CUTTING BARREL HEADS—By Chas. B. Hutchinson, of Waterloo, N. Y.: In relation to the head turning apparatus, I am aware that there is nothing novel in the use of clamp rings, as such, or of rotating cutting tools, such as fleam knives, chamfering chisels, and face planes, set on discs or otherwise; but the peculiar combination and arrangement of all these, which I have adopted, I believe to be wholly novel and not heretofore used, either for the purpose specified, or any other.

I claim the use of clamp rings to hold the pieces of heading, and hung in bearings on opposite sides or in any equivalent way, so as to be reversible in combination with the adjustable rotating cutters, to cut and bevel the edge of the head, and with the face cutters arranged upon the disc, as described, whereby the opposite sides of the head may be successively presented to the action of the cutting tools and the head cut out, chamfered, and face dressed or cut out and chamfered only, at one operation.

FRAMES FOR LANTERNS—By E. F. Parker, of Proctorsville, Vt.: I am aware that off-sets have been turned on the frames of lanterns, for holding the glass, &c., but the corner pieces are made up of two or more pieces soldered together, this I do not claim. But I claim the turning of grooved or sunken flanges upon the frames of lanterns, so that when the top and bottom are united, the flanges for holding the glass, mica, or their equivalents, shall be already in place to receive them without any further soldering, as described.

SCREW WRENCH—By G. B. Read, of New York City: I do not claim having the jaw attached to a shank, and the shank passing through a recess in the jaw, C, independent of the mode of operating the jaws; but I claim the arrangement of the several parts as described, viz., the jaw, C, being attached by a pivot to the stock, and having a recess through it, through which the shank of the adjustable jaw, E, passes, the shank being provided with a rack, into which a pawl attached to the end of the stock, catches, said pawl being kept into the rack by the spring, by which arrangement the two jaws, E and C, are forced against the sides of the nut as the handle of the wrench is turned, and the jaws made to bear or bind harder upon or near the corners of the nut, thus preventing the jaws from slipping around it.

GAS APPARATUS—By William and Matthias Stratton, of Philadelphia, Pa.: We claim, the consturection of the stove, removable gates in the ends, for the introduction of the retort and the movable section under the rosin holder, in the manner as set forth.

GLASS FURNACES—By Benj. Shiverick, of North Sandwich, Mass.: I claim combining the long conical valve and the discharge tube, by means of a set screw and nut, and supporting spring, whereby the flow of the melted rosin, may not only be regulated, but when any interruption takes place, the attendant can readily remove the same, either by lifting the valve or pressing on it, and such valve be subsequently moved back to its former position by the spring.

INDIA RUBBER—By Richard Solis, of New Brunswick, N. J.: I claim the manufacture of india rubber fabrics by the mixture of ground or powdered vulcanized rubber, with the ordinary india rubber of commerce.

VOLTAIC BATTERIES—Isaac L. Pulvermacher, of Preslaw, Prussia. Patented in Austria, Oct. 9, 1849. I do not clam simply making galvanic elements of negative and positive metals with porous, non-conducting substance interposed.

What I claim is constructing galvanic elements of positive and negative metals separated from each other by a porous non-conducting substance, when the said porous non-conducting sunstance is surrounded and held by one or both the said metals, substantially as specified.

Also forming the galvanic elements by coiling, in the form of helices, the positive and negative wires in grooves, previously made in the surface of an inner core of wood or other porous substance, as specified, so that when the wires are wrapped around in the said grooves, they shall both be in contact with the porous substance within and separate from each other, as specified.

Also forming a chain of a series of elements, as described, by means of ties or links, for the purpose specified.

Finally, the method of interrupting the current of electricity by means of the spring vibrating conductor, interposed as described, for the purpose of breaking and closing the circuit by the movement of the human body, or other like motion, as set forth.

RE-ISSUE.

DISCHARGING WATER FROM VESSELS—By Nehemiah Hodge, of North Adams, Mass. Dated Oct 19, 1852: I claim the combination of a system of two series of chambers, connecting pipes, discharging pipe, receiving hole or orifice and ventilating pipes, as arranged, connected, applied to the hold of a navigable vessel, and made to operate during the rolling or pitching movements thereof, for the purpose of elevating and discharging water therefrom, as set forth.

Extension of a Patent.

On the petition of Desire Buck, administratrix of Darius Buck, deceased, of Albany, N. Y., praying for the extension of a patent granted to him on the 20th of May, 1839, for an improvement in cooking stoves, for seven years from the expiration of said patent which takes place on the 20th day of May, 1853.

It is ordered that the said petition be heard at the Patent Office on Monday, the 11th of April, 1853, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

S. H. HODGES, Com. of Patents.

Washington, Dec. 12, 1852.

Riddle's Report of the Great Exhibition.

[Continued from page 166.]

SPECIMEN OF CARMINE.—This beautiful product is obtained from cochineal, and is so valuable an article as to be rarely met with in a state of purity. It is obtained by the following process:—boil 12 pounds of filtered rain water in a tin vessel, and add to it four ounces of finely-powdered cochineal; boil it for five minutes, constantly stirring with a glass rod; then add five scruples of alum in fine powder, perfectly free from iron; boil again for two minutes, remove the vessel from the fire, cover it, and allow the contents to settle. As soon as the liquor is clear, pour it, while still hot, into glass or porcelain vessels, and suffer it to remain some days, covered from dust.—The alum gradually precipitates the coloring matter, in combination with animal matter and a little alumina. The precipitate is put on a filter, washed, and dried in the shade.—It is one of the most beautiful red colors used by painters.

SEVERAL SPECIMENS OF WOOD PRESERVED BY CHEMICAL PROCESS.—All wood contains what is called albumen—an essential ingredient in vegetable bodies, entering largely into the composition of the sap. As long as this albumen is supplied with sufficient moisture, so long will it be liable to enter into a kind of fermentation, especially if placed in damp or ill-ventilated situations, and often even where the ventilation is perfect, and the atmosphere in its ordinary state of humidity. It a piece of green timber, containing this albumen in a perfect state of solution in the moisture of the wood, be employed in the construction of a house, the albumen undergoes fermentation and the rot and decay of the wood speedily follow.

How is this waste and destruction of wood to be prevented? To a certain extent, by thoroughly drying the timber in a current of air. This, however, takes considerable time to effect. For instance, a large piece of oak requires exposure for eight or ten years to dry it completely. This is demonstrated by the fact that it loses weight for that period. We may apply heat to hasten the process of drying, but the wood, when exposed to the ordinary temperature of the atmosphere, absorbs moisture in quantity varying with the compactness of the wood. In a dry room, without a fire, the quantity of water re-absorbed by wood, amounts, on an average, to ten per cent. As long as the albumen of the wood is supplied with sufficient moisture to render it soluble, so long will there be danger of dry rot. The best plan, therefore, to adopt, is to render this albumen perfectly insoluble, so that, however much moisture shall be absorbed, it cannot be brought into an active state again. For this purpose Sir H. Davy recommended that the wood should be steeped in corrosive sublimate—a salt called bichloride by chemists, which has the property of forming an insoluble compound with the albumen, and thus preventing its further action. This process was commercially applied by Wm. Kyan; but, from the great expense attending the preparation, and the fear that the use of this poisonous salt might prove deleterious to the health of persons coming in contact with it, the employment of corrosive sublimate has been abandoned.—Creosote oil, obtained from wood and coal tar, has been used with great success; but this also possesses a disadvantage, as it imparts a disagreeable odor, and increases the inflammability of the wood.

Some of the specimens exhibited by Mr. Payne are prepared, first, by injecting a salt of baryta into the pores of the wood, and then adding a solution of sulphate of iron. By this means a compact solid substance is formed, which remains in the wood, thereby increasing its weight, and partly converting it into stone. Sir W. Burnett & Co., have some specimens prepared by injecting chloride of zinc into the pores of the wood. This substance makes the albumen perfectly insoluble, even in sea water, does not communicate any color or odor to the wood, renders it less inflammable, whilst its use is perfectly innocuous in a sanitary point of view.

Recent Foreign Inventions.

MANUFACTURE OF LENSES.—Alfred Vincent Newton, patentee.—The dioptric lens, heretofore in use, for sea lights or other lights requiring great intensity, being constructed of single zones or rings, made up of segments according to the diameter of the required lens, has induced a belief that glass could not be prepared without incurring the expense of grinding and polishing the curved surface, and that economy dictated a method of manufacture embracing a centre and zones or segments. The inventor was induced to examine the method of the construction of the built up lens, to try and reduce the expense without diminishing the strength of the light. Commencing with the suggestions of Buffon, that a spherical body from its thickness absorbs light according to its density, and that a sectional figure of any required shape and thickness could be cast of glass and ground in concentric cones, to produce a lens, as partially accomplished by Abbe Rochon, who prepared the way for the manufacture of the dioptric lens in separate pieces by the ingenious Fresnel, termed "the annular band lens," which is now used in our best lighthouses. These lenses are very expensive, for each separate piece must not only have its surfaces formed with great accuracy, but all the separate pieces must be arranged to each other, so that when put together they shall form a perfect whole. This invention is to produce a dioptric lens which shall present all the practical advantages of Fresnel's annular band lens, at so cheap a rate as to admit of its being applied to all purposes requiring intensity of light. The inventor makes dioptric lenses in one or several pieces moulded and pressed into the form required for the surfaces, and when made in several pieces the required fit of the several parts is produced by giving the reversed required form to metal moulds in which the molten glass is to be run and pressed. To promote focal intensity, and prevent the absorption of light, each lens is manufactured as thin as the size and number of concavities and convexities will permit.

[The above is from Newton's London Repertory of Arts, Sciences, and Inventions; although the patent is in the name of Mr. Newton, the inventor, we believe, is a native of France. This improvement, if it answers according to the expectations of the inventor, is one of the most useful and important inventions that has been brought before the public in many years. The ferry lanterns placed on our docks at night, are very inefficient, so are the lights carried in front of the wheel-houses on the boats. We hope and trust that such an invention as this one purports to be will be the means of leading our ferry companies, of which there are now a great many connected with this city—to adopt them.

PURIFYING GAS.—W. S. Losh, of Carlisle, patentee.—This improvement consists in employing the chloride of lead reduced to powder and mixed with an equal bulk of coarsely powdered coke, or saw-dust, in order to allow the gas to move through it easily. These materials are mixed in a damp state, and laid upon the shelves of an ordinary dry lime purifier. The gas when passing through the chloride of lead and coke is deprived in a great measure of its ammonia and sulphurous components. Two such purifiers are used in conjunction, and when one ceases to act, the gas is turned on to the other. The chloride of lead can be brought back again for future use, by washing it, heating it to dryness, passing it through a sieve, and treating it with hydrochloric acid.

SUGAR.—Joseph Brandies, London, patentee.—This improvement consists in the use of the sulphurets and the hydrosulphurets of soda, potash, and ammonia for precipitating the lead used in refining saccharine solutions. The sugar under treatment is to be dissolved in the usual way, and when about heated to 180° Fah., 1½ per cent. of subacetate of lead is added and stirred in, and the solution is filtered. To the filtered liquor is then added a sufficient quantity of hydrosulphuret, or sulphuret of soda, potash, or ammonia to precipitate every trace of the lead solution, which may be tested by hydrosulphuric acid.

MALLEABLE IRON AND STEEL FROM CAST-IRON.—Jean E. Beauvelt, Paris, patentee.—This improvement consists in heating cast-iron in contact with metallic oxyde, or a carbonate containing a sufficient proportion of oxyde, and then rolling and hammering it without previous puddling. The cast-iron to be operated on should be cast into bars or plates in such a way that the bubbles and impurities may form the end bar or plate and be cut off with the rough end instead of being distributed over the surface. The substances used to change the character of the cast-iron are protoxyde of zinc and calamine, but the oxydes of iron, red oxyde of manganese, deutoxyde of copper, protoxyde of tin, or oxydes of lead may also be employed. The protoxyde of zinc, calamine, and oxydes of iron are the most suitable. The cast-iron bars are placed along with a sufficient quantity of the protoxyde or calamine in a common cementing case, and are raised to a cherry red heat in a suitable furnace, and kept at this heat till the process is completed.

COATING FOR WOOD AND METAL.—Laurent Machabee, of Avignon, France, patentee.—This composition consists in melting together three and one-fifth of an ounce of vegetable tar, one ounce mineral tar, one-sixth oz. of white grease with the addition of one-third of an ounce of Roman and hydraulic cement reduced to fine powder. The latter ingredients are added to the others in a boiling state. This stuff in a hot state is applied to metal or brick surfaces with a brush. Any number of coats may be put on. The proportions given may be pounds, we only present the parts by weight.

PAPER.—J. H. Brown, and J. Macintosh, of Aberdeen, Patentees.—This invention consists in using hollow moulds, composed of perforated metal, wire, or other suitable material, and covered with felt, within which, after their immersion in a vat of pulp, a partial vacuum is created, so as to cause the pulp to adhere or be deposited on the felt surface in a layer of uniform thickness. This process is applicable to the manufacture of sheets of paper and various articles, such as envelopes, bags, cases, &c. The articles after having been formed, are subjected to a drying process, and to pressure where their form will admit of it.—[London Mechanics' Magazine.

Shoemaking in Massachusetts.

There is an army of at least 500 shoemakers in Marlboro', Middlesex Co., Mass., who manufacture 6000 pairs of children's shoes every working day. One journeyman has worked on the bench for thirty years, without losing a day in consequence of sickness, and during that time has saved ten thousand dollars. One firm, during the last year, has manufactured 217,000 pairs of shoes. Another of the firms do an immense business, employing one hundred men in that State, and one hundred and fifty in their shoe village in New Hampshire. Last year they made two hundred thousand nine hundred and sixty-three pairs of shoes in Massachusetts, and at least as many more in New Hampshire.

Coal Mine on Fire.

The Broad Mountain Vein at Coal Castle, which took fire on the 13th of December, thirteen years since, still continues to pour forth its sulphuric gases, and in wet weather steam may be seen rising in volumes. For a distance of half a mile, this large vein has been entirely consumed above water level; how far below is not known.

Rise of an Island.

An island, one hundred feet in length, and seven feet in height, was recently formed in the Lake of Cleevets, near Eutin, in North Germany, by the effect of the hurricanes. In 1814, a similar phenomenon occured, but in a few months the isle suddenly disappeared, and there were twelve feet of water where it had been.

TO CORRESPONDENTS.

G. B., of N, Y.—You will get the information for calculating the power of high pressure engines in "Bourne's Catechism of the Steam Engine." It is authority, and we can find no better book to recommend to you at present.

J. F. M., of Pa.—We were told authoritatively that it was anthracite that was used, but did not pay the least attention to examine for ourselves.

S. and E., of N. Y.—Perhaps your plan for threshing as last submitted to us is an improvement on the one upon which the application for a patent is pending, but we fail to recognize the advantage of it.

A. W. D., of N. Y.—Your plan for a gas generator is very novel, and we should think it would operate well, but perhaps you had better construct one and try it before going to the expense of making an application for a patent.

W. E., of Boston.—We know persons who have used the burning fluid for a number of years without any accident taking place. Carefulness will do all that is required. We have received a letter from another person having a valve opening in a contrary direction to yours to do the same thing.

G. L. B., of Me.—We have received a letter from another person with a valve opening in a contrary direction from yours to do the same thing. Both cannot be right. We are obliged to you for mentioning about the water pails.

H. C., of Texas.—The inventor and patentee of the improvement mentioned in your letter of the 13th ult., is now in England, and upon his return we will endeavor to call up the subject of your enquiry.

H. G., of Mich.—We read every word of your long communication. We will defer our opinion until your arrival.

E. T., of Ill.—There is no machine for turning spokes not patented, which works satisfactorily, that we know of. J. M. Quimby, of N. J., is owner of Blanchard's patent.

J. McC., of N. Y.—An application is now pending at the Patent Office, for a machine substantially on the same plan as yours. If you wish to attest your right to the invention, you have only to make application for a patent, and the Commissioner will declare an interference, and call for evidence to prove priority.

R. O. W. H., of Tenn.—We have handed your letter over to a manufacturer for attention.

H. B. H., of Ohio.—We have carefully examined the model of your reaping and raking machine, and think the raking part to be new and patentable. We see nothing new in the reaping arrangement. There is no objection to your taking a patent.

W. D. B, of Mass.—You should always sign your name to communications addressed to this office, Your device appears to possess novelty sufficient to warrant an application for letters patent. You can send us a model.

J. C., of R. I.—Your ideas concerning the propelling of a balloon are absurd. We can offer you not a word of encouragement.

C. E. Bacon, of Buffalo, N. Y.—Your explanation is satisfactory, and we should have so stated before, but the matter was overlooked, amid the hurry of our business.

T. S. M., of Pa.—We have the same opinion in regard to the patentability of the lightning conductor and insulators, that we did before receiving your last letter.

W. D. W., of Raleigh.—The fact of your having paid us $30 was overlooked at the time you were last written to. Your case is proper ly entered upon our Patent Office record book, and will receive attention in its turn. You will have but $25 more to remit.

J. V. D., of Va.—We are sorry in not being able to furnish you with the back numbers of the present volume, but you are in no worse condition than hundreds of others who have been disappointed in like manner. The article on gun cotton will probably be published.

E. H., of Conn.—So far as we are able to judge of your improvements on the steam engine from such a description as you give, we think it is new.

A. P., of Me.—There have been many car couplings patented which purport to obviate the evil you propose to remedy, but you may have a different plan from any of the others for producing the result.

J. D. A., of O.—Your diagram presents a well-known invention.

Dr. Wright, of Calafornia.—Suitable engravings of your machine for separating extraneous matter from gold, would cost you $25, which amount we would thank you to remit.

E. Van C., of Pa.—Your new model has been received and forwarded to the Patent Office.

W. T. W., of Tenn.—The principle is the same in all hydraulic rams, and who makes the best we are unable to state. There is no doubt but that either of the parties will sell you a good mill.

J. M. D., of N. Y.—Your model has been received and the engravings will be executed and published in a few weeks.

Money received on account of Patent Office business for the week ending Saturday, Feb. 5:

C. V. D. H., of N. Y., $10; E. J. & J. W. B., of N. Y., $20, E. M., of N. Y., $30; T. R., of N. Y., $30; D. W. K., of Va., $7; J. P., of ——., $25; J. McM., of Ky., $10; W. R., of Mass, $25; W. P., of Mo., $2,50: C. L. O., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 5:

D. W. K., of Va.; W. R., of Mass.; C. L. O., of N. Y.

A Chapter of Suggestions, &c.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 and 3—none. Of Volume 4, about 20 Nos., price 50 cts. Of Volume 5, all but four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price in sheets, $2; bound, $2,75. Of Vol. 8, none.

PATENT CLAIMS—Persons desiring the claims o any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying

ADVERTISEMENTS.

Terms of Advertising.

4 lines, for each insertion,	-	-	50cts.
8 " " "	-	-	$1,00
12 " " "	-	-	$1,50
16 " " "	-	-	$2,00

Advertisements exceeding 16 lines cannot be admitted; neither can engravings be inserted in the advertising columns at any price.

☞ All advertisements must be paid for before inserting.

SCIENTIFIC MUSEUM.

Manufacture of Blue.

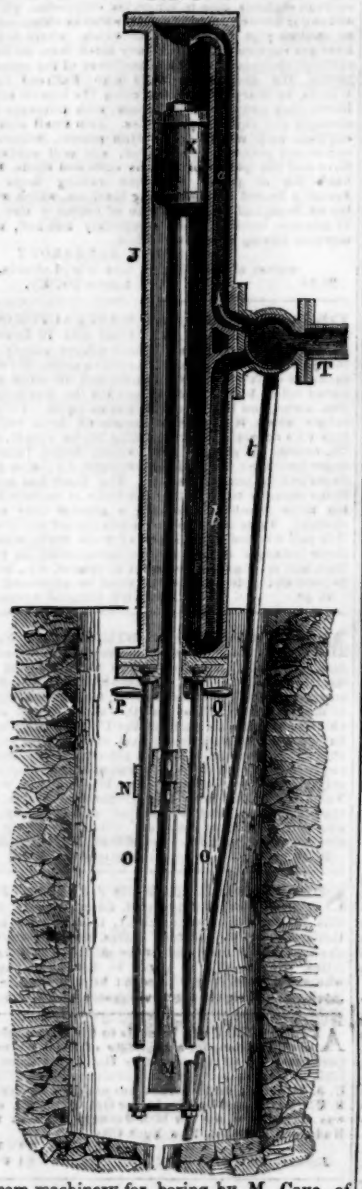
A blue coloring matter is made in Holland from the "Turnesol," and imported into other countries in cakes. A considerable quantity is used in France, particularly in the northern departments, where the Holland blue has a high reputation. An attempt has been lately made in that country to manufacture it at home. The tinctorial lichens that form the base of this blue, and which serve for preparing it, are the "Rocella Tinctoria," of the Canary Isles, the "Fuciformis" of Cape Verd, the "Tartarens" of Sweden and Norway, the "Lecanora Barella" of Auvergne (France), the "Imbilicaria Pustulata," common in the last-named country, and the "Rocella Fucopsis, very common on the elevated rocks of the Mediterranean Sea and Atlantic Ocean, and which is also very plentiful on the coast of Normandy, and of the Bay of Biscay, &c. There are many other lichens more or less esteemed as tinctorial, in Provence, Languedoc, Roussillon, (France), which are previously examined to determine the quality of their coloring matter, for this purpose the specimen is first pulverized and the powder placed in a vessel with a little sal ammoniac moistened with a mixture, in equal proportions, of liquid ammonia and lime, the vessel should be only half filled, so that when the mouth is stoppered it may contain some air. At the expiration of three or four days the lichen that is being tested ought to have turned to a red color. In this manner it is easy to determine the value of the various lichens offered for sale according to the degree of intensity of their red coloring. Having selected a preferable lichen it is pounded in a mortar, during which process sufficient water is added to form it into a thick paste, this is done to assist in pounding it. Equal quantities of lichen in this state and potash are then taken and mixed up together effectually, after which the compound is exposed to fermentation. This is caused by placing it in stone troughs in a building which is heated to a suitable temperature to keep up a continued fermentation until the reaction of the alkali on the coloring matter has taken place. When the paste has been placed in the troughs it is moistened with stale urine or urine containing carbonate of ammonia. This urine, therefore, developes much ammonia, which acts on the coloring matter; the compound is shaken several times, and after each time the troughs are covered to allow the gas from the ammonia to re-act on the dying substance, more urine being added whenever no further gas is emitted from the substance. The potash is intended to increase the action of the ammoniated urine on the coloring matter and to give it more strength. At the end of eight or ten days the mixture becomes a dull red, after twenty-five or thirty days it is a very fine purple red, and ten or twelve days after it changes completely to a blue. In this state ammoniated urine must be added, and the whole to be shaken as often as it seems expedient for about forty days. When the paste has become blue there is added one-fortieth part of lime to neutralize the ammonia, by causing a disengagement of this latter. Dissolved glue, in a suitable quantity, is then poured in to solidify it, and to bind together the substances that form the paste. It is of importance that its consistency should be such, that when steeped in warm water it should give to the water its blue color without dissolving, if it is too liquid it is left to evaporate. When it is of a proper consistency it is pounded in a machine to render it finer, and easier to be moulded, and after this placed in moulds and dried in the open air or near a stove. This coloring substance is a sort of lac, the base of which is the ligneous part of the lichen and the alkaline salts, and on which is fixed the coloring matter of the tinctorial lichens changed to blue by the action of the alkalies. It is used chiefly in France for whitewashing houses, by laundresses for getting up linen, by sugar refiners, &c. &c.; it is also useful as a substance called Turnesol dye, which is the most powerful agent in determining the presence of free acids, these acids flying to the alkali and changing the dye to a red, which is its essential color. —[Genie Industriel.

Wells, Pumps, &c.

[Continued from page 168.]

STEAM BORING MACHINE FOR QUARRIES, &c.—The annexed engravings are views of

FIG. 1



steam machinery for boring by M. Cave, of Paris, a celebrated French engineer, and which has been illustrated in the "London Artisan."

For the great majority of mining, quarrying, and tunnelling operations, boring and blasting is employed, and it is for this object that M. Cave's machinery is designed.

FIG. 2.

FIG. 3.

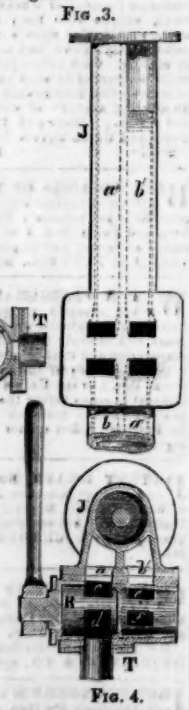


FIG. 4.

It consists of a cylinder and piston actuated by steam, compressed air, or by the vacuum system, the cutting tools being attached to the piston-rod, and acting by percussion. It thus resembles a Nasmyth's steam hammer; and a similar means is employed to destroy the momentum of the piston, by enclosing a portion of steam or air, which acts as a cushion at each end of the cylinder. To carry out this purpose, the inlet and exhaust passages are kept quite distinct, as will be seen on referring to the drawings.

Figure 1 is an elevation of the machine in section through the inlet passages; figure 2 is an elevation of the cylinder in section through the outlet passages; figure 3, is a front elevation, showing the passages; and figure 4 is a plan in section through the passages. J is the cylinder, containing the piston, K, to the rod of which is attached a cross-head, N, to which is also fixed the chisel, M. The cross-head and chisel are guided by the guide-rods, O O, which are fixed in a plate dovetailed into the cylinder cover, in such a manner, that it can be freely turned round (with the piston) by means of the handles, P Q, and thus enable the chisel to take a fresh cut at every stroke, without which it would jam. The annexed sketches show the shape of the chisel and its cutting edge.

The admission and emission of the compressed air or steam is regulated by a four-way cock, R, supplied by a pipe, T, as shown in figure 1. The air is admitted through the inlet passage, *a*, on the top of the piston, which will rapidly descend, until it passes the outlet, *a'*, figure 2, when, the further escape of air being prevented, the piston is stopped

by the air-cushion. On the up-stroke, the cock having been turned, the compressed air enters by the passage, *b*, and escapes by the passage, *b'*. It will be observed that the plug of the cock is divided transversely by a diaphragm, shown in fig. 4, to keep the passages distinct, *c* and *d* answering to the two inlet passages, and *e* and *f* to the two outlets.

The air which escapes by the cylinder is led, by the pipe, *t*, to near the point of the chisel, and will have the effect of blowing away the small chips loosened by the chisel.

The machine is shown in the engraving as working vertically; but it could obviously be applied to driving a level, by placing it horizontally and mounting it on a carriage.

If it be desired to bore a hole of larger diameter than the width of a chisel, the cutter can be fixed at any desired distance from the centre of the piston-rod, the revolution of which will cause the cutter to describe a circle of corresponding diameter.

For sinking shafts, a number of cylinders might be employed simultaneously, working a sufficient number of chisels to extend round the shaft; and the same arrangement applied horizontally would serve to drive a level.—In vertical boring the chisels have to be regularly withdrawn, in order to permit of the extraction of the *debris*; but we do not find that the author has provided any special means for effecting this object.

He has suggested that the electro-magnetic power may be applied to work this machinery; but air appears to offer the most tangible advantages. It can be conducted a great distance without suffering condensation, as steam does; and it would materially improve the atmosphere of the mine, by blowing in fresh air, or, if worked on the vacuum system, it would be equally advantageous in coal mines, by serving to draw off the fire-damp.

Man's Food.

What do men really live upon? The answer will be various enough. The Guacho, who in the wild pampas of Buenos Ayres, managing his half-wild horse with incredible dexterity, throws the lasso, or lolas, to catch the ostrich, the guanaco, or the wild bull, consumes daily from ten to twelve pounds of meat, and regards it as a high feast-day when in any hacienda he gains a variety in the shape of a morsel of pumpkin. The word bread does not exist in his vocabulary. The Irishman, on the other hand, regales himself in careless mirth on "potatoes and point," after a day of painful labor, he who cannot help making a joke even of the name he gives to his scanty meal. The hunter of the prairies lays low the buffalo with sure bullet; and its juicy, fat streaked hump, roasted between two hot stones, is to him the greatest of delicacies. Meanwhile, the industrious Chinese carries to market his carefully fattened rats delicately arranged upon white sticks, certain to find a good customer among the epicures of Pekin; and in his hot, smoky hut, fast buried beneath the snow and ice, the Greenlander consumes his fat, which he has just carved, rejoicing over the costly prize, from a stranded whale. Here the black slave eats the sugar-cane, and eats his banana; there the African merchant fills his wallet with sweet dates, his sole subsistence in the long desert journey; and there the Siamese crams himself with a quantity of rice from which a European would shrink appalled. And wheresoever over the whole inhabited earth we approach and demand hospitality, in almost every little spot a different kind of food is set before us, and the "daily bread" offered in another form.

Cooked Food for Cows.

Mr. James S. Huber, lately stated before the Philadelphia County Farmer's Club, that he had proved by actual experiment in feeding 12 cows, 180 days upon cooked food, that he made a net gain of $32. In place of 20 lbs. of hay per day, formerly fed raw, he now feeds 12 lbs. cut and steamed. With this he mixes 4½ quarts of shipstuff, Indian corn meal and oil cake meal, in about equal portions. This with the hay, weighs about 46 lbs. when cooked, having gained about 31 lbs. by that process. He says it is not only more economical, but more palatable to the cattle; they eat it without waste and keep in better condition. His steaming apparatus cost $25, which he more than saved in six months' feeding. He considers, however, the greatest gain is in the health of the animals.—[N. Y. Agricultor.

West Castleton Slate.

One hundred and fifty tons of West Castleton slate have been carried to Boston within the past week, making 350 tons in two weeks, over the Rutland, Cheshire, and Fitchburg roads. A gang of 500 men are to be employed in getting out this slate the coming summer. Extensive machinery is also to be introduced, and with these increased facilities, the directors of the company are confident that they can supply the American market with American slate of a superior quality, and at a much cheaper rate than has heretofore been paid.